

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA

Jed Margolin,

Plaintiff

v.

Charles F. Bolden, Administrator,
National Aeronautics and Space Administration,

Defendant.

Appendix

Jed Margolin
1981 Empire Rd.
VC Highlands, NV 89521-7430
Phone: 775-847-7845
Email: jm@jmargolin.com

Dated: July 31, 2009

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Exhibit

1

Jed Margolin
Phone: (408) 238-4564

3570 Pleasant Echo Dr.
Email: jm@jmargolin.com

San Jose, CA 95148-1916
June 17, 2003

Mr. Alan J. Kennedy
Director, Infringement Division
Office of the Associate General Counsel
National Aeronautics and Space Administration
Headquarters
Washington, DC 20546-0001

Attn: GP(02-37016)

Dear Mr. Kennedy,

I have received your letter dated June 11, 2003.

In my contacts with NASA personnel I have repeatedly stressed my desire that this matter be resolved in a friendly manner. However, since NASA has rejected my request to consider a license proffer and in view of your letter of June 11, it is clear that NASA has decided to handle this in an adversarial manner.

Before I respond to your letter in detail, I want to make things easier for me by withdrawing my U.S. Patent **5,566,073 Pilot Aid Using a Synthetic Environment** from this administrative claim in order to focus more directly on NASA's infringement of my U.S. Patent **5,904,724 Method and Apparatus For Remotely Piloting an Aircraft**. However, I reserve the right to file a claim concerning the '073 patent at a later time.

(1) *The identification of all claims of the patent(s) alleged to be infringed.*

As I stated in my email of May 13, 2003 to Mr. Hammerle of LARC and in my fax of June 7, 2003 to you, I have no way of determining exactly which claims the X-38 project may have infringed unless NASA makes a full and complete disclosure to me of that project. I also have no way of determining if NASA has (or has had) other projects that also infringe on my patent unless NASA makes a full and complete disclosure of those projects as well.

Therefore, in order to answer your question, I must request that NASA make a full and complete disclosure to me of the X-38 project as well as any other current or past projects that may infringe on my patent.

If this information requires a security clearance (I have none) I suggest you start the required security investigation immediately. If there is further information that you require in this regard feel free to contact me.

- (2) *The identification of all procurements known to the claimant or patent owner which involve the alleged infringing item or process, including the identity of the vendor or contractor and the Government procuring activity.*

As I stated in my fax to you of June 7, 2003, I became aware that NASA was using synthetic vision in the X-38 project in the January 2003 issue of NASA Tech Briefs, page 40, **"Virtual Cockpit Window" for a Windowless Aerospacecraft**. The article is available at:
<http://www.nasatech.com/Briefs/Jan03/MSC23096.html>

This led me to Rapid Imaging Software, Inc. and their press release (<http://www.landform.com/pages/PressReleases.htm>) which states:

"On December 13th, 2001, Astronaut Ken Ham successfully flew the X-38 from a remote cockpit using LandForm VisualFlight as his primary situation awareness display in a flight test at Edwards Air Force Base, California. This simulates conditions of a real flight for the windowless spacecraft, which will eventually become NASA's Crew Return Vehicle for the ISS. We believe that this is the first test of a hybrid synthetic vision system which combines nose camera video with a LandForm synthetic vision display. Described by astronauts as 'the best seat in the house', the system will ultimately make space travel safer by providing situation awareness during the landing phase of flight."

The RIS press release provided a link to an article in *Aviation Week & Space Technology*:
http://www.aviationnow.com/avnow/news/channel_space.jsp?view=story&id=news/sx381211.xml

As a result of more searching I discovered a link to a Johnson Space Center SBIR Phase II award to Rapid Imaging Systems at <http://sbir.gsfc.nasa.gov/SBIR/successes/ss/9-058text.html> .

It includes a particularly relevant paragraph:

The Advanced Flight Visualization Toolkit (VisualFlight™) project is developing a suite of virtual reality immersive telepresence software tools which combine the real-time flight simulation abilities with the data density of a Geographic Information System (GIS). This technology is used for virtual reality training of crews, analysis of flight test data, and as an on-board immersive situation display. It will also find application as a virtual cockpit, and in teleoperation of remotely piloted vehicles.

The emphasis on *virtual reality immersive telepresence* and *teleoperation of remotely piloted vehicles* is mine.

A search of the SBIR archive shows the following entries.

For 2001 Phase I:

Rapid Imaging Software, Inc.
 1318 Ridgcrest Place S.E.
 Albuquerque, NM 87108-5136
 Mike Abernathy (505) 265-7020
 01 H6.02-8715 JSC
 Integrated Video for Synthetic Vision Systems

For 2001 Phase II:

Rapid Imaging Software, Inc.
 1318 Ridgecrest Place S.E.
 Albuquerque , NM 87108-5136
 Carolyn Galceran (505) 265 - 7020
 01-2-H6.02-8715 JSC

Since my sources of information are limited to those available to the public (magazines such as *Aviation Week & Space Technology* as well as whatever I can find on the Internet) I have no way of knowing if there are other procurements, vendors, contractors, and Government procuring activity related to Claim I-222.

I believe that NASA is in a better position to know what it is (or has been) working on than I am.

- (3) *A detailed identification of the accused articles or processes, particularly where the article or process relates to a component or subcomponent of the item procured, an element by element comparison of the representative claims with the accused article or process. If available, this identification should include documentation and drawings to illustrate the accused article or process in suitable detail to enable verification of the infringement comparison.*

I believe I have answered this in section (2) as much as I am able to without NASA's cooperation.

- (4) *The names and addresses of all past and present licenses under the patent(s), and copies of all license agreements and releases involving the patent.*

There are no past licenses for this patent, and as of this date there are no present licenses for this patent. Naturally, I reserve the right to license this patent in the future as I see fit.

- (5) *A brief description of all litigation in which the patent(s) has been or is now involved, and the present status thereof.*

There has been no past litigation involving this patent, and as of this date there is no present litigation regarding this patent.

- (6) *A list of all persons to whom notices of infringement have been sent, including all departments and agencies of the Government, and a statement of the ultimate disposition of each.*

As of this date NASA is the only agency or department of the Government against which I have filed a claim.

5/11/03 – sent email to comments@hq.nasa.gov

*I believe that NASA may have infringed on one or more of my U.S. Patents.
How do I file a claim and whom do I contact?*

5/11/03 – Received reply:

*Date: Sun, 11 May 2003 17:48:46 -0400 (EDT)
From: "PAO Comments" <comments@bolg.public.hq.nasa.gov>
Message-ID: <200305112148.h4BLmkhJ011314@bolg.public.hq.nasa.gov>
To: <jm@jmargolin.com>
Subject: Thank you for your email.*

Thank you for your message to the NASA Home Page. The Internet Service Group will attempt to answer all e-mail regarding the site, but cannot guarantee a response by a particular time. The group will not be able to answer general inquiries regarding NASA, which should instead be sent to public-inquiries@hq.nasa.gov

5/11/03 – Sent email to <public-inquiries@hq.nasa.gov>

*I believe that NASA may have infringed on one or more of my U.S. Patents.
How do I file a claim and whom do I contact?*

Jed Margolin

As far as I can tell I did not receive a response.

5/12/03 – Sent email to j.c.midgett@larc.nasa.gov (found on Web site)

*I believe that NASA may have infringed on one or more of my U.S. Patents
How do I file a claim and whom do I contact?
(Or is my only recourse to sue in Federal Court?)*

Jed Margolin

5/12/03 – Received reply:

Mr. Margolin,

Thank you for contacting NASA with your concerns. I have referred this matter to the Patent Counsel Office, and they will be contacting you to work with you on this issue.

*Best wishes,
Jesse Midgett*

5/12/03 – Given my experience with trying to contact Government officials via email (or mail, or fax) I hadn't waited for the reply from J. Midgett. I had found the web site for the LARC (NASA Langley) Patent Counsel Office, and called up. I was connected to Kurt Hammerle and we had a nice talk. I sent him an email the next day (May 13, 2003).

I received a phone call from Barry Gibbens (757-864-7141) who, apparently, was calling because of my email to J.C.Midgett and hadn't seen the email I sent to K. Hammerle. (I explained to him what I had done.) We had a nice talk. He said he had already sent me a letter.

I received his letter and sent a reply on May 18, 2003 (USPS), adding to the email I had sent K. Hammerle.

Thursday, June 5, 2003 – Received message from B. Gibbens, asking me to call him because I should contact Alan Kennedy at NASA Headquarters (202-358-2065).

Friday, June 6, 2003 - I called B. Gibbens. Then I called A. Kennedy but he was out.

Saturday, June 7, 2003 – Sent a fax to A. Kennedy. The first number I tried (202-358-4341) only accepted 4 pages (out of 13). I tried a few times. Then I tried 202-358-2741. It turned out that 4341 was the correct number and that 2741 was another group. As a result, A. Kennedy initially only got 4 pages.

Monday, June 9, 2003 – Received message from A. Kennedy and called him back.

He had not gotten the fax so he went and found it. I learned the next day that he had only gotten 4 pages.

We had a “free and frank” discussion. I stressed that I wanted to resolve it in a friendly manner and that I preferred to have NASA buy the patent for the Government.

Tuesday, June 10, 2003 – Received a message from A. Kennedy and called him back.

He said that his Manager has turned down my request that NASA consider a license proffer and has decided to handle it as a Claim, and that the investigation would take 3-6 months.

However, NASA is not the only agency or department of the Government I have contacted.

7/5/1999 Email to: lbirckelbaw@darpa.mil

Dr. Birckelbaw, Project Manager for the UCAV contract awarded to Boeing.

Introduced myself and asked if DARPA was interested in my patent.

Response: none

7/26/1999 USPS Mail to:

Dr. Larry Birckelbaw
Program Manager, Aerospace Systems
DARPA Tactical Technology Office
3701 North Fairfax Drive
Arlington, VA 22203-1714

Introduced myself and asked if DARPA was interested in my patent. Enclosed copy of patent.

Response: none

Office of the Secretary of Defense (OSD)

Mr. E.C. "Pete" Aldridge
Under Secretary of Defense for Acquisition, Technology, and Logistics
U.S. Department of Defense

Contact Method: Email: webmaster@acq.osd.mil

May 3, 2002 and June 6, 2002

Response: none

Army - AATD, Fort Eustice, VA.

Col. Wado Carmona, Commander
Applied Aviation and Training Directorate (AATD)
Army Aviation and Missile Command
Ft. Eustice, VA

Contact Method:

Email: Ms. Lauren L. Sebring lsebring@aatd.eustis.army.mil
757-878-4828, fax: 757-878-0008

June 1, 2002

Phone Call Followup: She suggested I talk to Mr. Jack Tansey

Mr. Jack Tansey, Business Development 757-878-4105

June 18, 2002

Email Followup: jtansey@aatd.Eustis.army.mil

June 18, 2002

Air Force Research Laboratory (AFRL)

Dr. Barbara Wilson

Contact Method: email (Barbara.Wilson@wpafb.af.mil)

July 17, 2002

Response - none

Air Force Research Laboratory (AFRL)
 Dr. R. Earl Good, Director,
 Directed Energy Directorate
 Air Force Research Laboratory
 Kirtland Air Force Base, NM 87117-5776
 Contact Method: Fax (505-846-0423)
 Response: none

July 23, 2002

 Department of the Air Force
 Dr. James G. Roche
 Secretary of the Air Force
 Washington, DC

Contact Method: Fax (703-695-8809)

July 28, 2002

Response: Letter from
 Lt. General Charles F. Wald
 Deputy Chief of Staff, Air & Space Operations, USAF

August 13, 2002

(7) *A description of Government employment or military service, if any, by the inventor and/or patent owner.*

I have never been employed by the U.S. Government (or any other government). Likewise, I have never been in military service (in the United States or elsewhere). In the interests of full disclosure, I worked for three summers (1967, 1968, 1969) at the RCA Astro-Electronics Division in Hightstown, NJ . (They had a summer job program for students.)

(8) *A list of all Government contracts under which the inventor, patent owner, or anyone in privity with him performed work relating to the patented subject matter.*

None. I did this entirely on my own dime.

(9) *Evidence of title to the patent(s) alleged to be infringed or other right to make the claim.*

This appears to be a two-part question. Does the patent belong to Jed Margolin, and am I that Jed Margolin?

Part 1 - If you look at the front page of the '724 patent you will see that it was, indeed, issued to Jed Margolin, 3570 Pleasant Echo Dr., San Jose, CA.

If you contact the U.S. Patent and Trademark Office, Document Services Department (703-308-9726), you can order an Abstract of Title to verify that I own the patent. According to 37 CFR 1.12, assignment records are also open to public inspection at the United States Patent and Trademark Office.

Part 2 - If you look up Jed Margolin, 3570 Pleasant Echo Dr., San Jose, CA, in a telephone directory you will find assigned to it the telephone number 408-238-4564.

When you called me on June 9 and June 10, that was the number you called.

Other than my affirming that I am, indeed, the Jed Margolin in question, I can only suggest that you contact my cousin Lenny (oops, I mean Dr. Len Margolin) who is employed by Los Alamos National Laboratory, and ask him if he has a cousin Jed who is an engineer and an inventor, and who possesses the Margolin gene for being very persistent. (Some say stubborn.) The last time I saw him was in Ann Arbor, Michigan, after he had just passed the orals for his doctorate. (He bought me a beer at a place on South University.)

(10) *A copy of the Patent Office file of the patent, if available, to claimant.*

I do not have a copy of the USPTO's patent file. What I have is my prosecution file which contains, among other things, privileged communications between my patent attorney and myself.

Besides, in our telephone conversation of June 10, you stated that one of the research centers (I believe it was LARC) had already ordered the file.

(11) Pertinent prior art known to claimant, not contained in the Patent Office file, particularly publications and foreign art.

I have found no relevant prior art.

However, there is an interesting article in the June 2, 2003 issue of *Aviation Week & Space Technology* on pages 48-51 entitled **GA Riding 'Highway-in-the-Sky'** which describes, among other things, the work of Dennis B. Berlinger, lead scientist for flight deck research at the FAA's Civil Aeromedical Institute (CAMI) regarding what is called **Performance-Controlled Systems**. In the Specification of my '724 patent I call it **First Order RPV Flight Control Mode**. In Claim 18:

18. The station of claim 13, wherein said set of remote flight controls are configured to allow inputting absolute pitch and roll angles instead of pitch and roll rates.

An Internet search turned up Mr. Berlinger's report **Applying Performance-Controlled Systems, Fuzzy Logic, and Fly-By-Wire Controls to General Aviation** as DOT/FAA/AM-02/7.

I am pleased that Mr. Berlinger's May 2002 study confirms the value of Performance-Controlled Systems in piloted aircraft and I believe that teaching it in my '724 patent (filed January 19, 1999) gave an additional novel and useful aspect to my invention.

(The article also describes the Synthetic Vision system used in the FAA's Capstone program.)

If you have any further questions, please contact me.

Sincerely yours,

Jed Margolin

Enclosed: Response from General Wald
AWST article
Berlinger Report
U.S. Patent 5,904,724



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON, DC

13 Aug 02

HQ USAF/XO
1630 Air Force Pentagon
Washington, DC 20330-1630

Mr. Jed Margolin
3570 Pleasant Echo Dr.
San Jose, CA 95148-1916

Dear Mr. Margolin

On behalf of Secretary Roche, thank you for providing your ideas on ways to improve UAV control technology. As you know, we are now operating the Global Hawk and Predator systems in reconnaissance roles, and envision expanding unmanned aircraft applications into the weapons delivery mission area with theUCAV and the Predator/Predator B aircraft. Certainly we see a growing role for UAVs in the Air Force as technology advances and we gain experience in their operation. The improved control methods you have patented may well play a part in future UAV design. I suggest that you present these concepts to the various UAV manufacturers who are in the business of designing systems to meet our operational requirements. They can offer the best assessment on the overall feasibility of integrating your technology. I suggest a similar approach regarding your patented laser techniques.

Again, thank you for taking the time to offer these suggestions. I admire your ingenuity, and appreciate your desire to help us improve our national defense capabilities.

Sincerely

A handwritten signature in black ink, appearing to read "Charles F. Wald".

CHARLES F. WALD, Lt Gen, USAF
Deputy Chief of Staff
Air & Space Operations

cc:
SAF/AQ
AF/XOR



US005904724A

United States Patent [19] Margolin

[11] Patent Number: **5,904,724**
[45] Date of Patent: **May 18, 1999**

[54] **METHOD AND APPARATUS FOR REMOTELY PILOTING AN AIRCRAFT**
[76] Inventor: **Jed Margolin**, 3570 Pleasant Echo, San Jose, Calif. 95148

5,406,286 4/1995 Tran et al. 342/13
5,446,666 8/1995 Bauer 364/434
5,552,983 9/1996 Thornberg et al. 364/424.027
5,581,250 12/1996 Khviliviky 340/961

OTHER PUBLICATIONS

Lyons, J.W., "Some Navigational Concepts for Remotely Piloted Vehicles", AGARD Conference Proceed. n 176, Med. Accur. Low Cost Navig. at Avion, Panel Tec. Meeting, 5-1-5-15, Sep. 1975.
"US GeoData Digital Line Graphs", U.S. Dept. of the Interior, U.S. Geol. Surv. Earth Sci. Info Ctr. (Factsheet) Jun. 1993.
"US GeoData Digital Elevation Models", U.S. Dept. of the Interior. U.S. Geol. Surv. Earth Sci. Info Ctr. (Factsheet) Jun. 1993.
Shifrin, Carole A., "Gripen Likely to Fly Again Soon," *Aviation Week & Space Technology*, Aug. 23, 1993, pp. 72-73.

[21] Appl. No.: **08/587,731**
[22] Filed: **Jan. 19, 1996**
[51] Int. Cl.⁶ **G06F 165/00; H04N 7/18**
[52] U.S. Cl. **701/120; 701/2; 701/24; 244/189; 244/190; 348/114**
[58] **Field of Search** 364/423.099, 424.012, 364/424.013, 424.021, 424.022, 449.2, 449.7, 460, 439, 424.028; 340/825.69, 825.72, 967, 989, 991, 992, 993; 244/189, 190, 181, 17.13, 3.11, 3.15; 348/42, 51, 113, 114, 117, 123, 143; 382/154; 395/118, 119, 125

[56] References Cited

U.S. PATENT DOCUMENTS

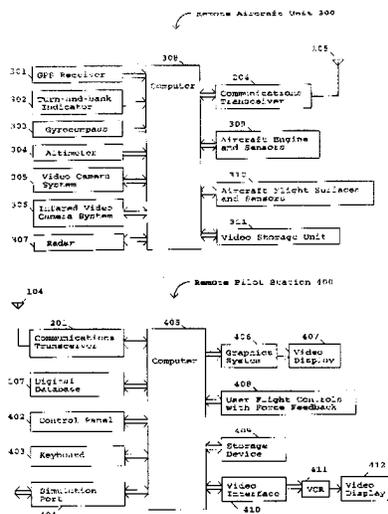
3,742,495	6/1973	Diamantides	342/64
3,795,909	3/1974	Vehrs, Jr.	343/7
4,218,702	8/1980	Brocard et al.	348/144
4,405,943	9/1983	Kanaly	358/133
4,467,429	8/1984	Kendig	343/433
4,660,157	4/1987	Beckwith et al.	345/421
4,739,327	4/1988	Konig et al.	342/26
4,760,396	7/1988	Barney et al.	342/65
4,835,532	5/1989	Fant	382/284
4,855,822	8/1989	Naredra et al.	364/423.099
4,964,598	10/1990	Berejik et al.	244/190
5,015,187	5/1991	Lord	364/462
5,072,396	12/1991	Fitzpatrick et al.	364/450
5,086,396	2/1992	Waruszewski, Jr.	364/454
5,155,683	10/1992	Rahim	364/424.029
5,179,638	1/1993	Dawson et al.	395/125
5,240,207	8/1993	Eiband et al.	364/423.099
5,257,347	10/1993	Busbridge et al.	395/129
5,266,799	11/1993	Steinitz et al.	324/330
5,272,639	12/1993	McGuffin	364/449
5,335,181	8/1994	McGuffin	364/443
5,381,338	1/1995	Wysocki et al.	348/116

Primary Examiner—Tan Q. Nguyen
Attorney, Agent, or Firm—Blakely, Sokoloff, Taylor and Zafman LLP

[57] ABSTRACT

A method and apparatus that allows a remote aircraft to be controlled by a remotely located pilot who is presented with a synthesized three-dimensional projected view representing the environment around the remote aircraft. According to one aspect of the invention, a remote aircraft transmits its three-dimensional position and orientation to a remote pilot station. The remote pilot station applies this information to a digital database containing a three dimensional description of the environment around the remote aircraft to present the remote pilot with a three dimensional projected view of this environment. The remote pilot reacts to this view and interacts with the pilot controls, whose signals are transmitted back to the remote aircraft. In addition, the system compensates for the communications delay between the remote aircraft and the remote pilot station by controlling the sensitivity of the pilot controls.

20 Claims, 7 Drawing Sheets



GA Riding 'Highway-in-the-Sky'

General aviation sector reaps the benefits of research originally conducted for military, commercial transport cockpits

BRUCE D. NORDWALL/WASHINGTON and OKLAHOMA CITY

General aviation aircraft are finally catching up with some of the advances found in the latest commercial transports and military cockpits, and in one particular sphere—display innovations—GA is actually taking the lead.

Researchers in industries and universities around the world have been pursuing a more intuitive guidance display for pilots for years. In general, this elusive presentation is referred to as highway-in-the-sky (HITS) (*AW&ST* Apr. 20, 1998, p. 58). In a twist that may foreshadow future advances, it was a general aviation aircraft that received the FAA's first certification of HITS technology for navigation guidance.

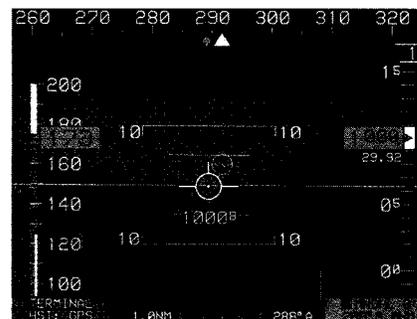
Instead of following course deviation

indicators and altimeters, a pilot using this HITS presentation flies through a series of 3D boxes on a multifunction display. By maneuvering through the 400 X 320-ft. boxes spaced at 2,000-ft.

Flying through "boxes in the sky" keeps pilots on course and altitude during a simulated curved instrument approach down the mountainous Gastineau Channel to Juneau, Alaska.

intervals along the planned GPS route of flight, the pilot keeps the aircraft on course and altitude, which is particularly helpful for a descending, curved instrument approach.

L.A.B. Flying Service's Piper Seneca made the first commercial revenue flight



using HITS in Juneau, Alaska, on Mar. 31. It followed an optimized area navigation (RNAV) route through airspace that would be inaccessible with conventional avionics.

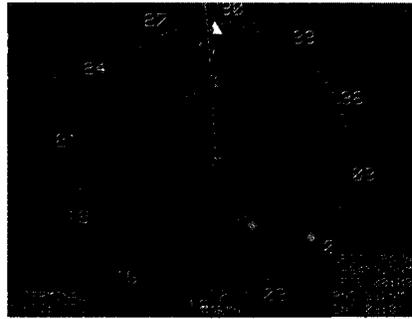
The system was built by Chelton Flight Systems as part of the second

phase of the imaginative Capstone program, an FAA industry/academic partnership in Alaska. The cockpit employs a Chelton FlightLogic electronic flight information system-synthetic vision (EFIS-SV) using two glass displays, one for primary flight guidance and one for navigation.

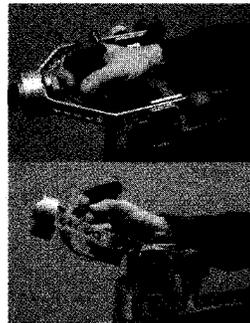
The big innovation is the use of synthetic vision symbology to present information to pilots. The initial EFIS systems digitally replicated the rudimentary attitude and flight-director symbols of electro-mechanical instruments from an earlier era. Now, in addition to the flight path, pilots see a real-time 3D view of the terrain and obstacles on the primary flight display. These are complemented by a moving map on the navigation display and by aural terrain warnings.

Among the other "firsts" claimed by Capstone Phase II on the Juneau flight were the use of forward-looking 3D terrain and HUD symbology on a certified primary flight display, and commercial

Automatic Dependent Surveillance-Broadcast (ADS-B) equipment (*AW&ST* Sept. 18, 2000, p. 68). With GPS as the enabling technology, that phase indicated that a low-cost system could give bush pilots many of the safety benefits long-standard for commercial jet transports. The emphasis was on reducing controlled flight into terrain accidents for these pilots, who usually operate out of the range of navigation aids or radar help from ATC. Phase II with HITS and synthetic vision greatly expands those capabilities.



The navigation display shows GPS WAAS position and an approach not possible with conventional navigation aids due to a 20-30-deg. turn after the GASTN waypoint to align with the runway.



CAMI tested a four-axis side-arm controller in a simulator as a replacement for stick and throttle in a fly-by-wire performance control system.

use of the GPS wide-area augmentation system (WAAS).

Capstone has equipped three aircraft in Alaska with the Chelton Flight Systems' cockpit, and plans to outfit every commercial operator in SE Alaska within the next 18 months. The contract for 125 aircraft could expand to up to 200, according to Gordon Pratt, Chelton's president. The FAA is providing the equipment at no charge in Alaska to any commuter and on-demand (FAA Part 135) operator of fixed-wing aircraft or

The next major safety enhancement for GA aircraft could come from "performance control," according to Dennis B. Beringer, lead scientist for flight deck research at the FAA's Civil Aeromedical Institute (CAMI) in Oklahoma City. While known more for assisting FAA's Aircraft Certification Service and Flight Standards in defining requirements for both aircraft and pilots, CAMI is also an active partner in human factors research to improve cockpits.

With **performance control**, non-pilots could learn to fly *a simulator in 15 min.*

helicopters. A supplemental type certificate for helicopters was scheduled to be delivered on May 31. An additional 10 aircraft are being outfitted in the contiguous U.S., Pratt said, but at the expense of aircraft owners.

The first phase of the Capstone Program started as a demonstration that equipped a number of commuter and air taxi aircraft in the Yukon-Kuskokwim River delta area with a low-cost GPS, a terrain database, data link and

The performance-control concept was introduced in the 1970s, before electronics were sufficiently advanced for implementation. Beringer said that now some of the fly-by-wire military and commercial aircraft use what could be legitimately called performance-control logic, which not only make aircraft easier to fly, but can also add flight envelope protection.

With conventional flight controls, a pilot has direct command of the aero-

dynamic surfaces. With performance control, his movements would be transmitted via a fuzzy-logic controller to a flight management system or an auto pilot that would guide the aircraft to carry out the

desired performance goal. But unlike a simple autopilot, which directs a change in heading at a limited rate of turn, performance-control logic changes control laws so that a pilot commands the rate of turn and bank, and rate of climb or descent. It simplifies command of more complicated maneuvers, and is a compromise between automated maneuvering and manual flight control, Beringer said. Safety is further enhanced using a self-centering (spring-loaded) side stick which returns to the centered position when the pi-

lot relaxes pressure, thus bringing the aircraft to straight and level flight.

The reduced number of control movements is one reason flying is easier. Going into a turn with conventional controls, the pilot has to initiate the roll, and then neutralize the ailerons when he achieves the desired bank angle. But with performance controls, one movement establishes the desired bank angle/turn rate. One downside to performance control with envelope protection is the inability to do aerobatics, such as an aileron roll or loop, Beringer said.

In the four-axis side-arm controller (above), rotating the wrist governs the rate of turn, flexing the wrist vertically directs the rate of climb or descent, and fore and aft movement varies the airspeed. Interest in performance controls was renewed with NASA's Agate (Advanced General Aviation Transport Experiments) program, which was concerned with simplifying the flight task and reducing ab initio training requirements. Agate has also been a strong supporter of HITS.

Researchers had previously found that with performance control, non-pilots could learn to fly a simulator in 15 min. Beringer tested the system in a simula-

tor configured as a Piper Malibu at CAMI. It used HITS displays and a four-axis side-arm controller. Twenty-four individuals with varying flight experience participated: six high-flight-time pilots; six low-flight-time pilots; six student pilots, and six non-pilots. Each flight involved a takeoff into instrument conditions, a continuous climb while turning downwind, a turn to intercept the instrument landing system glidepath, and a descent to landing. Flights were divided between use of a conventional yoke and the side-arm controller.

The findings were consistent. The aircraft was more stable and had less variations in course and altitude using performance control than with conventional controls. Although experienced pilots

The **big** **innovation** is use of synthetic vision symbology

always outperformed less-experienced individuals, with either system, all agreed the effort required was nearly halved.

Performance control is not apt to be seen in Piper Cubs, but perhaps in Beech Bonanzas and Piper Malibus. A lot of them already have two- or three-axis autopilots, so a significant capability could be achieved by rigging a side-stick control to the autopilot, Beringer said.

But two large problems must be overcome for performance controls to appear in the next generation of GA aircraft. The first is cost. Affordable and certifiable computer controls and servos would have to drop to a level competitive with more conventional systems.

Second, a fly-by-wire debate must be resolved. Could an affordable system be built with sufficient reliability using triple- or quad-redundancy, or would a costly manual-reversion be required? A mechanical backup would add cost for installation and for training pilots to operate the two systems.

Complicating that issue is the question of the level of reliability required. The FAA's current standard for a flight-critical system is a failure rate of 10^{-9} . While this is a standard for NASA, it might not be reasonable for general aviation aircraft. Beringer points out that the failure rate for humans is about 10^{-3} . ●

Exhibit

2

Jed Margolin

From: "Jed Margolin" <jm@jmargolin.com>
To: <nasafoia@nasa.gov>
Sent: Saturday, June 28, 2008 7:05 PM
Attach: jm_nasa.pdf
Subject: FOIA Request

This request is made pursuant to the Freedom of Information Act.

I would like all documents related to the **Administrative Claim of Jed Margolin for Infringement of U.S. Patent Nos. 5,566,073 and 5,904,724; NASA Case No. I-222.**

I am attaching a letter dated June 11, 2003 from Alan Kennedy, Director, Infringement Division, Office of the Associate General Counsel as file *jm_nasa.pdf*. I provided the information requested, it was received by Mr. Kennedy, and thereafter Mr. Kennedy refused to respond to my attempts to find out the results of the investigation.

I believe NASA has had enough time to have completed its investigation by now.

Jed Margolin
1981 Empire Rd.
Reno, NV 89521-7430
775-847-7845
www.jmargolin.com

Exhibit

3

National Aeronautics and Space Administration
Headquarters
Washington, DC 20546-0001



August 5, 2008

Reply to Attn of: Office of the General Counsel

Mr. Jed Margolin
1981 Empire Road
Reno, NV 89521-7430

Re: Administrative Claim of Jed Margolin for Infringement of U.S. Patent
Nos. 5,566,073 and 5,904,724; NASA Case No. I-222.

Dear Mr. Margolin,

We are in receipt of the Freedom of Information Act Request (FOIA) conveyed to us by email dated June 30, 2008 in which you request copies of all documentation relating to your administrative claim of infringement of U.S. Patent Nos. 5,566,073 and 5,904,724.

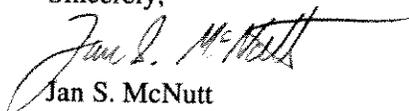
We regret the delay in processing your claim and assure you that we are now undertaking measures to provide a resolution of your claim as soon as possible. Unfortunately, Mr. Alan Kennedy retired from NASA earlier this year and the action on your claim was not conveyed to management in a timely manner. In addition the local attorney responsible for review of your claim also departed from NASA. We are now cognizant of the importance of proceeding with a review of the claim and will contact you when we have reached a decision.

As to your FOIA request, as the investigation of your claim is ongoing, we kindly request that you allow us a 90 day extension to answer this request. Within that time period we should be able to obtain a better picture of our position vis-à-vis your claim and the request for documents may no longer be required.

We should inform you that we have received a separate communication from a company Optima Technology Group, claiming to have been assigned both of the patents in question. You informed me telephonically that this is the case; however, we have no record of any assignment of your patents to this firm and will need confirmation through appropriate attested documents delivered to the agency in order to recognize any claim of ownership by a party other than the inventor.

Thank you for your patience in this matter. Please contact the undersigned at (202) 358-0632 or email Jan.McNutt@nasa.gov if you have any additional questions or comments.

Sincerely,


Jan S. McNutt
Attorney-Advisor

Exhibit

4

Jed Margolin
Phone: 775-847-7845

1981 Empire Rd.
jm@jmargolin.com

Reno, NV 89521-7430
August 8, 2008

Mr. Jan S. McNutt
Office of the General Counsel
NASA Headquarters
Washington, DC 20546-0001

Re: FOIA Request (FOIA HQ 08-270) regarding NASA Case No. I-222

Dear Mr. McNutt,

As we discussed in our recent telephone conversations, my FOIA Request is entirely separate from NASA Claim Case I-222. The patents involved in the claim are now owned by Optima Technology Group, Inc. I trust that Optima Technology Group has now provided you with the documentation you requested in order to establish their ownership of the Patents.

I will agree to the 90 day extension you have requested for NASA to respond to my FOIA Request (HQ 08-270) if NASA acknowledges that my FOIA request is entirely separate from Optima Technology Group's Claim Case No. I-222.

Sincerely yours,


Jed Margolin

Exhibit

5

Jed Margolin
Phone: 775-847-7845

1981 Empire Rd.

Reno, NV 89521-7430
April 27, 2009

Mr. Christopher J. Scolese,
Acting Administrator, NASA
300 E Street, SW
Washington, DC 20546
(202) 358-2810 (Fax)

Dear Sir,

I sent you a letter by certified mail on April 6, 2009. According to USPS it has not been delivered. USPS has several theories:

1. They lost it;
2. NASA refused to accept delivery;
3. Something happened to it when it was sent to New Jersey to be irradiated.

I am appending the letter to this fax.

The letter asks you to confirm that I have exhausted all of the administrative remedies that NASA has to offer in my attempt to get NASA to comply with the Freedom of Information Act. Since it took me an hour this morning just to get a fax number for you -I was misdirected all around NASA- the answer is obviously, "Yes."

When I file suit against NASA in the U.S. District Court For the District of Nevada I had planned to mail the Complaint to you. Since it does not seem possible to mail anything to NASA with any hope of success, will you allow me to email or fax the Complaint to you and will you waive Service?

If you refuse, I will have to pay a process server to serve you. Then I will amend my Complaint to ask the Court to assess costs and punitive damages against NASA.

Sincerely yours,

Jed Margolin

Cc: Senator Harry Reid

Jed Margolin
Phone: 775-847-7845

1981 Empire Rd.

Reno, NV 89521-7430
April 6, 2009

Mr. Christopher J. Scolese,
Acting Administrator,
NASA
300 E. Street, SW
Washington, DC 20546

Dear Sir,

NASA has been acting in bad faith toward me for the past almost-6 years.

I am the named inventor on U.S. Patent 5,904,724 **Method and apparatus for remotely piloting an aircraft** issued May 18, 1999. This patent teaches the use of (what is now called) synthetic vision for controlling a UAV.

I contacted NASA in May 2003 after I became aware that NASA had used synthetic vision in the X-38 project. Because the use of synthetic vision for controlling a UAV can be used to the detriment of this country by unfriendly entities I wanted a friendly conversation because I thought NASA should buy the patent in order to control the technology

In June 2003 I was turned over to Mr. Alan Kennedy in the Office of the General Counsel. This is what I recorded in my Contact Log:

Summary: He basically said that what most independent inventors have is junk and that since I am an independent inventor what I have is probably junk. If NASA evaluates it as a license proffer it will give it a pro forma rejection and I will file a claim anyway, so the same people who rejected it as a proffer will reject it as a claim, but in the process will have had to do more work, so to save them some work they will ignore the proffer and handle it as a claim.

So, I filed a claim, completely answering all the questions on NASA's claim form. Then Mr. Kennedy informed me that NASA would conduct an investigation (expected to last 3-6 months) and that the purpose of the investigation would be to find prior art to invalidate the patent.

After six months I did not hear from NASA so I called Mr. Kennedy. He said:

1. The investigation had not been done.
2. NASA had a Research Exemption for using the patent. [Not true. See *Madey v. Duke* 307 F.3d 1351 (Fed. Cir. 2002)]
3. "The X-38 never flew." I informed him of the video on NASA's web site showing the X-38 flying.

4. The Statute of Limitations gives NASA 6 years to respond to my claim. (Wrong, it gives me 6 years to take NASA to Federal Claims Court.)
5. It would cost me more to sue NASA in Federal Claims Court than I could hope to recover from NASA.

After that, Mr. Kennedy refused to talk to me or respond to my letters. Then, various things came up and I was unable to pursue my claim against NASA.

Subsequently, I assigned the patent to Optima Technology Group, which has inherited the claim.

However, I still wanted to know what came up during the investigation so, on July 1, 2008 I filed a FOIA request. It was assigned FOIA HQ 08-270.

For some reason it was turned over to Mr. Jan McNut in the Office of the General Counsel.

His response is attached as *Reference 1*.

On August 5, 2008 Mr. McNut asked me to give NASA a 90-day extension to my FOIA request. I agreed.

In January, 2009 I received a letter from Mr. McNut who sent me back to the FOIA Office (*See Reference 2*), who wanted me to start over from scratch. Ms. Kelly Robinson then explained that she was currently working on FOIA requests filed two years before.

I told her that NASA did not get a do-over.

In the interests of brevity:

1. I talked to Ms. Robinson on March 18, 2009. She said she was sending me the results of the FOIA search, but there was some material she would not send me before it was internal Agency communications.
2. That was almost three weeks ago I have not received anything from NASA.

Therefore, Mr. Scolese, please confirm that I Have Exhausted All the Administrative Remedies that NASA Has to Offer. I need you to do this so I can bring suit against NASA in Federal Circuit Court.

If you fail to respond to this letter within ten days I will assume the answer is “Yes.”

And I will note your failure to respond in my upcoming article, “How NASA Defrauds Independent Inventors.” (That was not the title when this process started.) I will be sending the article to the various House and Senate oversight committees.

Sincerely yours,

Jed Margolin

Exhibit

6

Jed Margolin

From: "HQ-FOIA" <hq-foia@nasa.gov>
To: <jm@jmargolin.com>
Sent: Monday, May 18, 2009 12:30 PM
Attach: 2008-270.pdf; 08-270.DOC
Subject: FOIA 2008-270

FOIA 08-270

May 14, 2009

Mr. Jed Margolin
1981 Empire Road
Reno, NV 89521-7430
jm@jmargolin.com

Dear Mr. Margolin:

This is in response to your request received on June 30, 2008, pursuant to the Freedom of Information Act (FOIA) for *documents related to the Administrative Claim of Jed Margolin for infringement of U.S. Patent Nos. 5,566, 073 and 5,904,724; NASA Case No. I-222.*

The NASA Headquarters Office of the General Counsel conducted a search and from that search provided the enclosed documents responsive to your request.

It has been determined that portions of the records found responsive to your request contain information which is exempt from disclosure under the deliberative process privilege of Exemption 5. This privilege covers advisory opinions, recommendations, and deliberations, which are part of the government decision-making process, 5. U.S.C. §552(b)(5).

You may appeal this initial determination to the NASA Administrator. Your appeal must (1) be addressed to the Administrator, National Aeronautics and Space Administration, Washington, DC 20546, (2) be clearly identified on the envelope and in the letter as an "Appeal under the Freedom of Information Act", (3) include a copy of the request for the agency record and a copy of this initial adverse determination, (4) to the extent possible, state the reasons why you believe this initial determination should be reversed, and (5) be sent to the Administrator within thirty (30) calendar days of the receipt of this initial determination.

I apologize for the delay in processing your request. I appreciate your patience.

Sincerely,

Original Signed

Kellie N. Robinson
FOIA Public Liaison Officer
Headquarters
NASA
300 E Street, SW
Washington, DC 20546

Enclosures

From: McConnell, Stephen (HQ-NB000) [mailto:stephen.mcconnell-1@nasa.gov]
Sent: Tuesday, July 01, 2008 8:45 AM
To: foia@hq.nasa.gov
Cc: Robinson, Kellie N. (HQ-NB000)
Subject: FW: FOIA Request

From: Jed Margolin [mailto:jm@jmargolin.com]
Sent: Saturday, June 28, 2008 10:06 PM
To: nasafoia@nasa.gov
Subject: FOIA Request

This request is made pursuant to the Freedom of Information Act.

I would like all documents related to the **Administrative Claim of Jed Margolin for Infringement of U.S. Patent Nos. 5,566,073 and 5,904,724; NASA Case No. I-222.**

I am attaching a letter dated June 11, 2003 from Alan Kennedy, Director, Infringement Division, Office of the Associate General Counsel as file *jm_nasa.pdf*. I provided the information requested, it was received by Mr. Kennedy, and thereafter Mr. Kennedy refused to respond to my attempts to find out the results of the investigation.

I believe NASA has had enough time to have completed its investigation by now.

Jed Margolin
1981 Empire Rd.
Reno, NV 89521-7430
775-847-7845
www.jmargolin.com

Exhibit

7

National Aeronautics and Space Administration

Headquarters

Washington, DC 20546-0001



March 19, 2009

Reply to Attn of:

Office of the General Counsel

CERTIFIED MAIL

Dr. Robert Adams, CEO
Optima Technology Group
1981 Empire Road
Reno, NV 89521

RE: Administrative Claim for Infringement of US Patent No. 5,904,724;
NASA Case No. I-222

Dear Dr. Adams:

This letter concerns the above-identified administrative claim for patent infringement.

NASA received the initial notification of this claim in an email dated May 12, 2003, from Mr. Jed Margolin addressed to attorneys at the NASA Langley Research Center claiming that "NASA may have used one or more of [Mr. Margolin's] patents in connection with the X-38 project and may be using one or more of my patents in other projects using Synthetic Vision". Mr. Margolin identified two patents that he believed NASA may be infringing; the subject patent and Patent No. 5,566,073. On June 7, 2003, Mr. Margolin submitted his claim by fax to the NASA HQ attorney, Mr. Alan Kennedy. Mr. Kennedy responded by letter dated June 11, 2003 acknowledging the administrative claim and requesting that Mr. Margolin give a more detailed breakdown of the exact articles or processes that constitute the claim. Mr. Margolin responded by letter dated June 17, 2003, withdrawing his claim with regard to U.S. Patent No. 5,566,073, leaving the remaining claim for the subject patent. NASA is aware of the long pendency of this matter and we regret the delay.

On July 14, 2008 Optima Technology Group sent a letter addressed to Mr. Kennedy stating that they were the owners of the Jed Margolin patents due to an assignment and requesting that NASA now license the technology of the subject patent. With an email dated August 6, 2008 from Optima, NASA received a copy of a Patent Assignment, dated July 20, 2004, executed by Jed Margolin, the sole inventor on the subject patent, by which the entire right, title and interest in the patent has been assigned to Optima Technology Group, Inc. We previously noted in a letter dated August 20, 2008 from Mr. Jan McNutt of our office addressed to you that NASA believes there are certain irregularities surrounding this and collateral assignment documents associated with the subject patent. However, NASA will at this time forestall a detailed consideration of that issue. Instead, we will assume your *bona fides* in asserting that you are the legitimate owner of the subject patent and communicate

our findings directly with you. To the extent that Mr. Margolin has any interest in this matter, formally or informally, we will leave it up to you whether or not to communicate with him.

In light of the prior claim by Mr. Margolin, we consider your license proffer as an administrative claim of patent infringement. We turn now to the substance of your claim. In response to your initial letter dated July 14, 2008, Mr. McNutt's August 20, 2008 letter posed a number of questions, the purpose of which was to enable NASA to fully evaluate the details of your claim. Your organization failed to respond to these questions and, further, advanced the position that this matter does not involve a *new* claim (*Adams letter to McNutt, August 25, 2008*). We disagree that this is not a new claim. Nevertheless, NASA proceeds – in order to bring closure to this matter – on the basis that this claim centers around allegations that infringement arose from activities associated with NASA's X-38 Program, as advanced by Mr. Margolin. Accordingly, our investigation of this claim necessarily reflects the answers previously furnished by Mr. Margolin in response to NASA's June 11, 2003 letter to him containing substantially the same set of questions.

U.S. Patent No. 5,904,724 issued with twenty claims, claims 1 and 13 being the sole independent claims.

In order for an accused device to be found infringing, each and every limitation of the claim must be met by the accused device. To support a finding of literal infringement, each limitation of the claim must be met by the accused device exactly, any deviation from the claim precluding a finding of infringement. See *Lantech, Inc. v. Keip Mach. Co.*, 32 F.3d 542 (Fed. Cir. 1994). If an express claim limitation is absent from an accused product, there can be no literal infringement as a matter of law. See *Wolverine World Wide, Inc. v. Nike, Inc.*, 38 F.3d 1192, 1199 (Fed. Cir.1994).

In applying these legal precepts, reproduced below are the relevant portions of claims 1 and 13.

Claim 1. A system comprising:

* * *

a computer

* * *

said computer is. . .for *determining a delay time* for communicating said flight data between said computer and said remotely piloted aircraft, and wherein said computer adjusts the sensitivity of said set of one or more remote flight controls based on said delay time.
(emphasis added.)

Claim 13. A station for flying a remotely piloted aircraft that is real or simulated comprising:

* * *

a computer

* * *

said computer. . . to *determine a delay time* for communicating. . . flight control information between said computer and [a] remotely piloted aircraft, and said computer to adjust the sensitivity of [a] set of remote flight controls based on said delay time. . . (emphasis added.)

NASA has investigated activities surrounding the X-38 program at its Centers that conducted X-38 development efforts and has determined that no infringement has occurred. This result is compelled because none of NASA's X-38 implementations utilized a computer which is "for determining a delay time for communicating said flight data between said computer and said remotely piloted aircraft," as required by claim 1, nor a "computer . . . to determine a delay time for communicating . . . flight control information between said computer and [a] remotely piloted aircraft," as required by the limitations of claim 13.

Given that a computer which measures delay time is lacking from the NASA X-38 configuration, it follows that the NASA X-38 configuration had no "adjusting of the sensitivity of [a] set of one or more remote flight controls based on said delay time", as required in claim 1. Similarly, because the NASA X-38 configuration had no "computer to determine a delay time for communicating . . . flight control information between said computer and [a] remotely piloted aircraft, the configuration also had no adjusting of "the sensitivity of [a] set of remote flight controls based on said delay time", as called for by claim 13.

For at least the above-explained exemplary reasons, claims 1 and 13 have not been infringed. It is axiomatic that none of the dependent claims may be found infringed unless the claims from which they depend have been found to be infringed. *Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546 (Fed. Cir. 1989). One who does not infringe an independent claim cannot infringe a claim dependent on, and thus containing all the limitations of, that claim. *Id.* Thus, none of claims 2-12 and 14-20 have been infringed.

NASA's X-38 development efforts ended in 2002. There may also be other features in NASA's X-38 development efforts that, upon further analysis, would reveal yet more recited claim limitations that are lacking in the NASA configuration related to those efforts.

We also note as a point of particular significance that the limitations included in claims 1 and 13 discussed above were added by amendment during the prosecution of the patent application. It is clear from an analysis of the patent application file wrapper history that the individual prosecuting the application stressed the importance of "the measurement of a communication delay in order to adjust the sensitivity of flight controls based on that delay." Also noted is the distinguishing arguments that these claims require that there be a "computer . . . located in the pilot station" and that "at least one real time measurement of the delay and some adjustment is contemplated." (See *Applicant's Amendment and Remark*, February 27, 1998 and *Response Under 37 C.F.R. § 1.116*, July 6, 1998). Clearly, the Patent Office Examiner allowed the application based on these prosecutorial arguments.

We have completed our investigation regarding the claim of patent infringement of U.S. Patent No. 5,904,724 and have determined that there is no patent infringement by, or

unauthorized use on behalf of, NASA. The above detailed discussion explains the basis for NASA's analysis and decision regarding the subject administrative claim.

As an aside, during NASA's investigation, numerous pieces of evidence were uncovered which would constitute anticipatory prior knowledge and prior art that was never considered by the U.S. Patent and Trademark Office during the prosecution of the application which matured into Patent No. 5,904,724. In view of the clear finding of lack of infringement of this patent, above, NASA has chosen to refrain from a discussion that would demonstrate, in addition to non-infringement, *supra*, invalidity of the subject patent. However, NASA reserves the right to introduce such evidence of invalidity in an appropriate venue, should the same become necessary.

This is a FINAL agency action and constitutes a DENIAL of the subject administrative claim for patent infringement.

Pursuant to 35 U.S.C. § 286, the statute of limitations for the filing of an action of patent infringement in the United States Court of Federal Claims is no longer tolled. Thus, any further appeal of this decision must be made by filing a claim for patent infringement in the United States Court of Federal Claims, pursuant to 28 U.S.C. § 1498(a).

Sincerely,



Gary G. Borda
Agency Counsel for Intellectual Property

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- Addressee's Address
- Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
 DR. L. ADAMS CEO
 OPTIMA TECH GROUP
 1981 EMPIRE ROAD
 RENO, NV 89521

4a. Article Number: 7007 26800012216

4b. Service Type 4563

Registered Certified
 Express Mail Insured
 Return Receipt for Merchandise COD

7. Date of Delivery

5. Received By: (Print Name)

6. Signature: (Addressee or Agent)
 X

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1994 102595-98-B-0229 Domestic Return Receipt

Thank you for using Return Receipt Service.

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Restricted Delivery Fee (Endorsement Required)		
Total Postage & Fees	\$	

Sent To: DR L ADAMS CEO
 Street, Apt. No., or PO Box No.: 1981 EMPIRE ROAD
 City, State, ZIP+4: RENO NV 89521

PS Form 3800, August 2006 See Reverse for Instructions

Exhibit

8

Jed Margolin
Phone: 775-847-7845

1981 Empire Rd.
Email: jm@jmargolin.com

Reno, NV 89521-7430
June 10, 2009

Administrator
NASA Headquarters
Washington, DC 20546

Appeal under the Freedom of Information Act to the NASA Response dated May 14, 2009 and received via email May 18, 2009.

Jed Margolin

FOIA 08-270

Filed: June 28, 2008

Sir:

This is an Appeal under the Freedom of Information Act to the NASA Response dated May 14, 2009 and received via email May 18, 2009 [*Appendix NA1 - NA65*] in FOIA Request 08-270 filed June 28, 2008 [*Appendix NA66*].

Because NASA's response was sent (and received) on May 18, 2009 this appeal is timely.

Summary

In its very tardy response to FOIA Request 08-270 by Jed Margolin ("Margolin") NASA withheld documents, citing *5 U.S.C. §552(b)(5)*.

One of the documents that NASA withheld from Margolin is a letter dated March 19, 2009 that was sent by Gary G. Borda ("Borda") NASA Agency Counsel for Intellectual Property to Optima Technology Group ("OTG"). (This document was given to Margolin by OTG.) In this letter Borda denies Claim I-222 regarding NASA's infringement of U.S. Patent 5,904,724 ('724) in the X-38 project.

Margolin's FOIA 08-270 request to NASA was to produce documents relating to Claim I-222 and NASA withheld the most material document so far.

The Borda letter asserts:

“... numerous pieces of evidence were uncovered which would constitute anticipatory prior knowledge and prior art that was never considered by the U.S. Patent and Trademark Office during the prosecution of the application which matured into Patent No. 5,904,724.”

And states, “... NASA reserves the right to introduce such evidence of invalidity in an appropriate venue, should the same become necessary.”

Circulating the patent report solely within NASA or among other federal agencies is not an appropriate venue for NASA to use to have a patent declared invalid. The only appropriate venues for NASA to challenge the validity of a U.S. Patent are in the U.S. Court of Federal Claims and the Court of Appeals for the Federal Circuit. A Court will not accept NASA's word that a patent is invalid due to prior art; NASA would be required to produce the evidence.

Therefore, the exemption under *5 U.S.C. §552(b)(5)* does not apply.

The Borda letter also suggests the existence of other materials and/or documents, especially relating to whether NASA risked the X-38 by failing to provide compensation for the time delays in the synthetic vision flight control loop.

Details

Most of the documents NASA sent to Requestor Jed Margolin (“Margolin”) were documents Margolin already had, especially the documents Margolin had himself sent to NASA. There were other documents NASA admits to having but refused to provide [*Appendix NAI*]:

It has been determined that portions of the records found responsive to your request contain information which is exempt from disclosure under the deliberative process privilege of Exemption 5. This privilege covers advisory opinions, recommendations, and deliberations, which are part of the government decision-making process, 5. U.S.C.§552(b)(5).

The reference 5. U.S.C.§552(b)(5) states, referring to Section (a) which requires agencies to make information available to the public:

(b) This section does not apply to matters that are -

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.

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(5) inter-agency or intra-agency memorandums or letters which would not be available by law to a party other than an agency in litigation with the agency;

NASA did not give an *estimate* of the volume of the documents being withheld, in violation of 5 U.S.C.§552(a)(6)(F):

(F) In denying a request for records, in whole or in part, an agency shall make a reasonable effort to estimate the volume of any requested matter the provision of which is denied, and shall provide any such estimate to the person making the request, unless providing such estimate would harm an interest protected by the exemption in subsection (b) pursuant to which the denial is made.

And, since NASA did not give even a minimal description of the documents being withheld, that would probably have been the end of the matter. Without even a minimal description of the documents being withheld Margolin would have had no way of knowing if NASA was acting properly and in good faith.

NASA has a record of acting in bad faith toward Margolin. See:

1. Letter from Jed Margolin to Alan Kennedy (NASA Office of the General Counsel) dated January 6, 2004 confirming a portion of the telephone conversation Margolin had with Kennedy on December 10, 2003 [*Appendix NA72*]
2. Fax from Jed Margolin to Acting Administrator Scolese dated April 27, 2009 detailing NASA's almost-6 years of bad faith shown to Margolin. [*Appendix NA73*]

Note that neither document was included in NASA's Response to Margolin's FOIA Request, which suggests NASA withheld them in an attempt to avoid embarrassment to the Agency and for no other reason. *5 U.S.C. §552(b)* does not include "embarrassment to the agency" as a reason to withhold documents.

NASA is still acting in bad faith toward Margolin.

One of the documents that NASA withheld from Margolin is a letter dated March 19, 2009 that was sent by Gary G. Borda ("Borda") NASA Agency Counsel for Intellectual Property to Optima Technology Group ("OTG"). (This document was given to Margolin by OTG.) In this letter Borda denies Claim I-222 regarding NASA's infringement of U.S. Patent 5,904,724 ('724) in the X-38 project. [*Appendix NA80*]

Margolin's FOIA 08-270 request to NASA was to produce documents relating to Claim I-222 and NASA withheld the most material document so far.

The Borda letter is so important that it will be reproduced here in its entirety.

Dear Dr. Adams:

This letter concerns the above-identified administrative claim for patent infringement.

NASA received the initial notification of this claim in an email dated May 12, 2003, from Mr. Jed Margolin addressed to attorneys at the NASA Langley Research Center claiming that "NASA may have used one or more of [Mr. Margolin's] patents in connection with the X-38 project and may be using one or more of my patents in other projects using Synthetic Vision". Mr. Margolin identified two patents that he believed NASA may be infringing; the subject patent and Patent No. 5,566,073. On June 7, 2003, Mr. Margolin submitted his claim by fax to the NASA HQ attorney, Mr. Alan Kennedy. Mr. Kennedy responded by letter dated June 11, 2003 acknowledging the administrative claim and requesting that Mr. Margolin give a more detailed breakdown of the exact articles or processes that constitute the claim. Mr. Margolin responded by letter dated June 17, 2003, withdrawing his claim with regard to U.S. Patent No. 5,566,073, leaving the remaining claim for the subject patent. NASA is aware of the long pendency of this matter and we regret the delay.

On July 14, 2008 Optima Technology Group sent a letter addressed to Mr. Kennedy stating that they were the owners of the Jed Margolin patents due to an assignment and requesting that NASA now license the technology of the subject patent. With an email dated August 6, 2008 from Optima, NASA received a copy of a Patent Assignment, dated July 20, 2004, executed by Jed Margolin, the sole inventor on the subject patent, by which the entire right, title and interest in the patent has been assigned to Optima Technology Group, Inc. We previously noted in a letter dated August 20, 2008 from Mr. Jan McNutt of our office addressed to you that NASA believes there are certain irregularities surrounding this and collateral assignment documents associated with the subject patent. However, NASA will at this time forestall a detailed consideration of that issue. Instead, we will assume your *bona fides* in asserting that you are the legitimate owner of the subject patent and communicate

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our findings directly with you. To the extent that Mr. Margolin has any interest in this matter, formally or informally, we will leave it up to you whether or not to communicate with him.

In light of the prior claim by Mr. Margolin, we consider your license proffer as an administrative claim of patent infringement. We turn now to the substance of your claim. In response to your initial letter dated July 14, 2008, Mr. McNutt's August 20, 2008 letter posed a number of questions, the purpose of which was to enable NASA to fully evaluate the details of your claim. Your organization failed to respond to these questions and, further, advanced the position that this matter does not involve a new claim (*Adams letter to McNutt, August 25, 2008*). We disagree that this is not a new claim. Nevertheless, NASA proceeds — in order to bring closure to this matter — on the basis that this claim centers around allegations that infringement arose from activities associated with NASA's X-38 Program, as advanced by Mr. Margolin. Accordingly, our investigation of this claim necessarily reflects the answers previously furnished by Mr. Margolin in response to NASA's June 11, 2003 letter to him containing substantially the same set of questions.

U.S. Patent No. 5,904,724 issued with twenty claims, claims 1 and 13 being the sole independent claims.

In order for an accused device to be found infringing, each and every limitation of the claim must be met by the accused device. To support a finding of literal infringement, each limitation of the claim must be met by the accused device exactly, any deviation from the claim precluding a finding of infringement. See *Lantech, Inc. v. Kelp Mach. Co.*, 32 F.3d 542 (Fed. Cir. 1994). If an express claim limitation is absent from an accused product, there can be no literal infringement as a matter of law. See *Wolverine World Wide, Inc. v. Nike, Inc.*, 38 F.3d 1192, 1199 (Fed. Cir.1994).

In applying these legal precepts, reproduced below are the relevant portions of claims 1 and 13.

Claim 1. A system comprising:

a computer

said computer is,.. for *determining a delay time* for communicating said flight data between said computer and said remotely piloted aircraft, and wherein said computer adjusts the sensitivity of said set of one or more remote flight controls based on said delay time. (emphasis added.)

Claim 13. A station for flying a remotely piloted aircraft that is real or simulated comprising:

a computer

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said computer... to *determine a delay time* for communicating. . flight control information between said computer and [a] remotely piloted aircraft, and said computer to adjust the sensitivity of [a] set of remote flight controls based on said delay time. ... (emphasis added.)

NASA has investigated activities surrounding the X-38 program at its Centers that conducted X-38 development efforts and has determined that no infringement has occurred. This result is compelled because none of NASA's X-38 implementations utilized a computer which is "for determining a delay time for communicating said flight data between said computer and said remotely piloted aircraft," as required by claim 1, nor a "computer ... to determine a delay time for communicating ... flight control information between said computer and [a] remotely piloted aircraft," as required by the limitations of claim 13.

Given that a computer which measures delay time is lacking from the NASA X-38 configuration, it follows that the NASA X-38 configuration had no "adjusting of the sensitivity of [a] set of one or more remote flight controls based on said delay time", as required in claim 1. Similarly, because the NASA X-38 configuration had no "computer to determine a delay time for communicating ... flight control information between said computer and [a] remotely piloted aircraft, the configuration also had no adjusting of "the sensitivity of [a] set of remote flight controls based on said delay time", as called for by claim 13.

For at least the above-explained exemplary reasons, claims 1 and 13 have not been infringed. It is axiomatic that none of the dependent claims may be found infringed unless the claims from which they depend have been found to be infringed. *Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546 (Fed. Cir. 1989). One who does not infringe an independent claim cannot infringe a claim dependent on, and thus containing all the limitations of, that claim. *Id.* Thus, none of claims 2-12 and 14-20 have been infringed.

NASA's X-38 development efforts ended in 2002. There may also be other features in NASA's X-38 development efforts that, upon further analysis, would reveal yet more recited claim limitations that are lacking in the NASA configuration related to those efforts.

We also note as a point of particular significance that the limitations included in claims 1 and 13 discussed above were added by amendment during the prosecution of the patent application. It is clear from an analysis of the patent application file wrapper history that the individual prosecuting the application stressed the importance of "the measurement of a communication delay in order to adjust the sensitivity of flight controls based on that delay." Also noted is the distinguishing arguments that these claims require that there be a "computer ... located in the pilot station" and that "at least one real time measurement of the delay and some adjustment is contemplated." (See *Applicant's Amendment and Remark*, February 27, 1998 and *Response Under 37 C.F.R. § 1.116*, July 6, 1998). Clearly, the Patent Office Examiner allowed the application based on these prosecutorial arguments.

We have completed our investigation regarding the claim of patent infringement of U.S. Patent No. 5,904,724 and have determined that there is no patent infringement by, or

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unauthorized use on behalf of, NASA. The above detailed discussion explains the basis for NASA's analysis and decision regarding the subject administrative claim.

As an aside, during NASA's investigation, numerous pieces of evidence were uncovered which would constitute anticipatory prior knowledge and prior art that was never considered by the U.S. Patent and Trademark Office during the prosecution of the application which matured into Patent No. 5,904,724. In view of the clear finding of lack of infringement of this patent, above, NASA has chosen to refrain from a discussion that would demonstrate, in addition to non-infringement, *supra*, invalidity of the subject patent. However, NASA reserves the right to introduce such evidence of invalidity in an appropriate venue, should the same become necessary.

This is a FINAL agency action and constitutes a DENIAL of the subject administrative claim for patent infringement.

Pursuant to 35 U.S.C. § 286, the statute of limitations for the filing of an action of patent infringement in the United States Court of Federal Claims is no longer tolled. Thus, any further appeal of this decision must be made by filing a claim for patent infringement in the United States Court of Federal Claims, pursuant to 28 U.S.C. § 1498(a).

Sincerely,

Gary G. Borda
Agency Counsel for Intellectual Property

The Borda letter is not just a material document, it's a smoking gun.

1. Despite the documents supplied by OTG, and Margolin's confirmation in a telephone conversation with Jan McNutt (Office of the General Counsel), that OTG owns the subject patent, NASA continues to cast doubt on the legal ownership of the patent.

We previously noted in a letter dated August 20, 2008 from Mr. Jan McNutt of our office addressed to you that NASA believes there are certain irregularities surrounding this and collateral assignment documents associated with the subject patent.

2. NASA asserted it had found prior art to invalidate the patent.

As an aside, during NASA's investigation, numerous pieces of evidence were uncovered which would constitute anticipatory prior knowledge and prior art that was never considered by the U.S. Patent and Trademark Office during the prosecution of the application which matured into Patent No. 5,904,724. In view of the clear finding of lack of infringement of this patent, above, NASA has chosen to refrain from a discussion that would demonstrate, in addition to non-infringement, *supra*, invalidity of the subject patent. However, NASA reserves the right to introduce such evidence of invalidity in an appropriate venue, should the same become necessary.

In order to make this statement, NASA must have produced a patent report showing how each reference is directed to the claims in the '724 patent. This patent report is not exempt under *5 U.S.C. §552(b)(5)* because it is not "inter-agency or intra-agency memorandums or letters which would not be available by law to a party other than an agency in litigation with the agency;"

The reason it is not exempt is because "NASA reserves the right to introduce such evidence of invalidity in an appropriate venue, should the same become necessary."

Circulating the patent report solely within NASA or among other federal agencies is not an appropriate venue for NASA to use to have a patent declared invalid. The only appropriate venues for NASA to challenge the validity of a U.S. Patent are in the U.S. Court of Federal Claims and the Court of Appeals for the Federal Circuit. A Court will not accept NASA's word that a patent is invalid due to prior art; NASA would be required to produce the evidence.

Since this patent report is material under Margolin's FOIA Request and is not exempt under *5 U.S.C. §552(b)(5)* Margolin requests NASA immediately hand it over to him.

There is another reason NASA needs to hand over the patent report. Although Margolin no longer owns the '724 patent he is still the named inventor. By asserting it has evidence to invalidate the patent, and then withholding that evidence, NASA has defamed Margolin's reputation as an inventor. It also smacks of 1950s McCarthyism (making damaging accusations without providing proper evidence).

Margolin takes such attacks seriously. There is an article in the December 2008 issue of AUVSI's Unmanned Systems Magazine entitled **Synthetic Vision Technology for Unmanned Systems: Looking Back and Looking Forward** by Jeff Fox, Michael Abernathy, Mark Draper and Gloria Calhoun [*Appendix NB58*].

The article consists of a spurious history of synthetic vision. Many of the listed sources are from NASA, such as the HiMat project. [*Appendix NB8*] (While HiMat produced valuable results, it did not use synthetic vision.)

Margolin responded with the article **Synthetic Vision – The Real Story**. [*Appendix NBI*].

Although the editor of AUVSI Magazine had promised Margolin the opportunity to respond in the magazine, he later refused to even mention the controversy about the Abernathy article. [*Appendix NB60*]

NASA should be familiar with the name Mike Abernathy (Rapid Imaging Software). He provided the synthetic vision system for the X-38 project.

NASA should also be interested in the statements made on Abernathy's behalf in a letter from Abernathy's law firm to Optima Technology Group dated October 13, 2006. [*Appendix NA143*]

As you know, RIS creates computer software, and does not use or manufacture UAV systems or ground control stations. RIS software is used in UAVs to provide situation awareness for sensor operators. It is not used for piloting air vehicles. The sensor operator does not pilot the aircraft, and instead sits at a separate workstation operating a payload containing one or more cameras, which may be controlled using a joystick to point the camera package during search or tracking operations.

As you know, RIS refuses to allow its products to be used as a pilot aid, and RIS product licenses specifically prohibit use for piloting. None of RIS's customers use its software for piloting, for very good reason. Serious military regulations control placement of anything -synthetic vision included- on a pilot workstation. Before anything can be placed on the display in front of a pilot, it has to have met stringent criteria (MIL-STD 1787C, DO-178B, etc.), it must have been thoroughly ground tested, and it must have been fully flight tested. RIS software has never been through this process, and thus is prohibited from use for piloting. Accordingly, UAV manufacturers have purchased RIS products for use on the

sensor operator console, but none for the pilot console. This is a matter of Army doctrine and applies to Shadow, Warrior and Hunter.

Nor does RIS have its software in a form that would make it marketable for piloting. RIS software products are all based on the Microsoft Windows operating system. This offers many advantages, but is inappropriate to piloting aircraft because it is not a POSIX compliant real-time operating system. POSIX compliance is required by flight safety regulations. To create such a version would entail a one- to two-year conversion program in which RIS has not invested.

It is important to realize that the market for RIS products is quite different from the relaxed civilian world. If a military pilot chose to use synthetic vision in spite of military regulations or in defiance of a software license agreement, his career would be damaged or destroyed. Military pilots cherish their wings and would not consider risking them on something like synthetic version.

Finally, it appears from your correspondence that you regard research activities like NASA's X-38 prototypes (before the program was cancelled in 2002) as infringing the Margolin patents. This was not the case because of the claim limitations of the Margolin patents. However all RIS work for government agencies, including NASA, was authorized and consented to by the U.S. Government, and is protected under 28 U.S.C. §1498(a). As you are aware, any remedies you may have are against the government and are circumscribed by that statute and related law.

Although we need not discuss the invalidity of the Margolin patents given the above circumstances, you should be aware that both patents were anticipated by profound prior art dating back to 1977. If it should ever become necessary, we are confident that both would be held invalid.

(emphasis added)

He is asserting that Abernathy's synthetic vision software may not be used for piloting an aircraft, either remotely or with the pilot onboard. And yet, it was used for remotely piloting the X-38. [*Appendix NB20*]

From *Appendix NB21*:

On December 13th, 2001, Astronaut Ken Ham successfully flew the X-38 from a remote cockpit using LandForm VisualFlight as his primary situation awareness display in a flight test at Edwards Air Force Base, California. This simulates conditions of a real flight for the windowless spacecraft, which will eventually become NASA's Crew Return Vehicle for the ISS. We believe that this is the first test of a hybrid synthetic vision system which combines nose camera video with a LandForm synthetic vision display. Described by astronauts as "the best seat in the

house", the system will ultimately make space travel safer by providing situation awareness during the landing phase of flight.

Did NASA really trust the safety of an expensive test vehicle (X-38) to a synthetic vision system using Microsoft Windows?



To end this section, note that in 5 *U.S.C.* §552(f):

(f) For purposes of this section, the term—

(1) “agency” as defined in section 551 (1) of this title includes any executive department, military department, Government corporation, Government controlled corporation, or other establishment in the executive branch of the Government (including the Executive Office of the President), or any independent regulatory agency; and

(2) “record” and any other term used in this section in reference to information includes—

(A) any information that would be an agency record subject to the requirements of this section when maintained by an agency in any format, including an electronic format; and

(B) any information described under subparagraph (A) that is maintained for an agency by an entity under Government contract, for the purposes of records management.

Under this definition, neither Margolin nor Optima Technology Group (the owner of Claim I-222) is an “agency.” It also means that NASA is required to provide the records between NASA and Rapid Imaging Software (Mike Abernathy) which provided the synthetic vision system for the X-38 project which was referred to in the Borda letter.

3. The basis for NASA's rejection of Claim I-222 in the Borda letter is that the X-38 project did not implement one of the elements in the patent claims.

said computer is,.. for determining a delay time for communicating said flight data between said computer and said remotely piloted aircraft, and wherein said computer adjusts the sensitivity of said set of one or more remote flight controls based on said delay time. (emphasis added.)

To be precise, said computer does more than determine and compensate for time delays.

Claim 1 says:

1. A system comprising:

a remotely piloted aircraft including,

a position determining system to locate said remotely piloted aircraft's position in three dimensions; and

an orientation determining system for determining said remotely piloted aircraft's orientation in three dimensional space;

a communications system for communicating flight data between a computer and said remotely piloted aircraft, said flight data including said remotely piloted aircraft's position and orientation, said flight data also including flight control information for controlling said remotely piloted aircraft;

a digital database comprising terrain data;

said computer to access said terrain data according to said remotely piloted aircraft's position and to transform said terrain data to provide three dimensional projected image data according to said remotely piloted aircraft's orientation;

a display for displaying said three dimensional projected image data; and

a set of one or more remote flight controls coupled to said computer for inputting said flight control information, wherein said computer is also for determining a delay time for communicating said flight data between said computer and said remotely piloted aircraft, and wherein said computer adjusts the sensitivity of said set of one or more remote flight controls based on said delay time.

Claim 13 says:

13. A station for flying a remotely piloted aircraft that is real or simulated comprising:

a database comprising terrain data;

a set of remote flight controls for inputting flight control information;

a computer having a communications unit configured to receive status information identifying said remotely piloted aircraft's position and orientation in three dimensional space, said computer configured to access said terrain data according to said status information and configured to transform said terrain data to provide three dimensional projected image data representing said remotely piloted aircraft's environment, said computer coupled to said set of remote flight controls and said communications unit for transmitting said flight control information to control said remotely piloted aircraft, said computer also to determine a delay time for communicating said flight control information between said computer and said remotely piloted aircraft, and said computer to adjust the sensitivity of said set of remote flight controls based on said delay time; and

a display configured to display said three dimensional projected image data.

Is Borda saying that NASA did not determine and compensate for time delays in the X-38 synthetic vision flight control loop or simply that NASA did not use a computer to do so? If they did not use a computer, what did they use?

NASA is well aware of the problems caused by failing to compensate for time delays in flight control systems.

When a UAV is manually flown by a remote pilot, failure to compensate for delays in the communications link will lead to Pilot-Induced-Oscillation, which frequently leads to the loss of the aircraft.

This is a potential problem in Flight Control Systems even in aircraft with the pilot onboard.

The article **Fly-By-Wire - A Primer for Aviation Accident Investigators** (Air Line Pilot, February 2000, page 18 By F/O Steve Stowe (Delta), Local Air Safety Chairman, Delta Council 16) gives a basic explanation of the Control Systems Engineering analysis of the problem. From *Appendix NA87*:

Now for the bad news. While FBW technology could make an aerodynamically unstable aircraft flyable, it can also destabilize an otherwise stable airframe.

FBW flight control laws may not be stable for all values of gain or phase angle (the difference between pilot input and airplane response in terms of frequency; exactly opposite would be a 180-degree phase angle) that can be applied. Now costarring with static margin as stability factors are "gain margin" and "phase margin"-- measures of how much additional gain or phase-angle lag are available until the system becomes unstable. Computer simulation or flight testing can determine these two margins. But these data are often the manufacturer's proprietary information, so don't look for it on your weight-and-balance sheet.

Highly augmented aircraft, in which fly-by-wire transforms the basic aircraft aerodynamics, can exhibit cliff-like handling qualities.

“One reason is that fly-by-wire systems are susceptible to time delay, from a number of causes, which can seriously degrade the pilot's ability to control the aircraft. Time delay may vary for different sizes or frequencies of inputs. U.S. military standards suggest that time delays should be less than one tenth of a second for good handling qualities and that loss of control may occur with delays more than one quarter of a second (MIL STD 1797).”

(emphasis added)

Fly-By-Wire” means the aircraft surfaces are controlled through a computer instead of being controlled directly by the pilot.

From the same article [*Appendix NA92*]:

* **Time delay**--Delay from pilot input to FBW aircraft response. Caused by many factors including the effect of filters, computer processing time, task time-sharing by computers and signal processors, "higher order" effects of the feedback control system, digital sampling effects, and/or actuator rate limiting. Time delays of more than 0.25 second can cause enough lag to make the FBW aircraft unstable during certain tasks, especially in "high gain" situations.

(emphasis added)

There was a problem with Pilot-Induced-Oscillation during the development of the Space Shuttle. The following is from NASA Technical Memorandum NASA-TM-81366
ANALYSIS OF A LONGITUDINAL PILOT-INDUCED OSCILLATION EXPERIENCED ON THE APPROACH AND LANDING TEST OF THE SPACE SHUTTLE , Author: J. W. Smith, December 1981.

From the Introduction (*Appendix NA96*):

During the final free flight (FF-5) of the shuttle's approach and landing test (ALT) phase, the vehicle underwent pilot-induced oscillations (PIO's) near touchdown (refs. 1 to 3). The oscillations were present in both the pitch and roll axes and were initiated when the pilot made pitch controller inputs in an effort to control sink rate by changing pitch attitude. Because the control inputs were large and fairly rapid, the elevons rate limited in the pitch axis at the maximum priority rate limit set in the computers. The elevon rate limit also limits the vehicle's roll control capability, and this was partially responsible for the lateral control problem.

Several unpublished studies indicate that time delays as well as priority rate limiting were a significant factor in the PIO's. A simulator study of the effect of time delays on shuttle PIO's is reported in reference 4.

This report describes the combined effect of pilot input rate limiting and time delays. Frequency responses are predicted for various parameters under rate saturated conditions by using nonlinear analysis.

(emphasis added)

Note that the above references were for Flight Control Systems for aircraft with the pilot onboard. When an aircraft is flown manually through a communications link, the delays caused by the communications link become part of the flight control system.

From U.S. Patent 5,904,724 column 8, lines 14 – 36 [*Appendix NA142*]:

Flying an RPV is further complicated because there are additional time delays in the loop. The computer in the remote aircraft must first determine the aircraft's position and orientation. The additional processing for transmitting a secure signal by encryption and/or spread spectrum techniques may create additional delays. Transmission delay of signals between the remote aircraft and remote pilot station is negligible for a direct path. However, if the signals are relayed through other facilities the delay time may be appreciable, especially if an orbiting satellite is used. There are additional delays in the remote pilot station as the remote aircraft's position

and orientation are used to transform the data from the digital database to present the pilot with the synthesized 3D projected view from the remote aircraft. In one embodiment, the RPV system measures the various delays and modifies the control laws used by the computer in the remote pilot aircraft and in the feedback provided by the computer in the remote pilot station to the remote pilot. For example, the computer may adjust the sensitivity of the User Flight Controls 408 according to the delay (e.g., as the delay increases, the computer will decrease the sensitivity of the flight controls). The system also displays the measured delay to the remote pilot.

The issue of time delay in a UAV communications link was addressed in the literature by the Master's Thesis **Improving UAV Handling Qualities Using Time Delay Compensation** by Andrew J. Thurling (17 Sep 97-24 Feb 00, AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH). From *Appendix NA139*:

Abstract

This study investigated control loop time delay and its effect on UAV handling qualities. Compensation techniques to improve handling qualities in the presence of varying amounts of time delay were developed and analyzed. One technique was selected and successfully flight-tested on a UAV.

Flight-testing occurred at a constant flight condition with varying levels of additional time delay introduced into the control loop. Research pilots performed a pitch tracking task and gave Cooper-Harper ratings and comments. Tracking errors were used as a quantitative measure of Pilot/Display/UAV system performance.

Predictive pitch compensation was found to significantly reduce pilot workload and improve Cooper-Harper ratings. Using the predictive display doubled the amount of system time delay that research pilots could tolerate while tracking the task bars. Overall system tracking performance, however, was not improved.

Parameter variations of +/- 20% in the aerodynamic model used to generate the predictive display produced statistically significant, although not operationally significant, changes in both pilot opinion and performance.

Analysis of flight test data and follow-on simulations resulted in predictor improvements that increased predictor accuracy to the point of restoring system tracking performance to equal that of the system with no additional time delay.

From *Appendix NA140*:

Preface

The effects of control system time delays on manned aircraft handling qualities are well understood. Unmanned aircraft have similar control, system delay, but have an additional latency caused by the datalink of the human operator's commands from control station to aircraft. The purpose of this thesis is to investigate the effects of time delay on the handling qualities of Unmanned Aerial Vehicles (UAV) and develop compensation strategies to mitigate the adverse effects of the delay. It is my hope that with techniques developed and investigated in this thesis future UAV operators will be able to employ UAVs from anywhere in the world thus increasing the flexibility of this already versatile platform.

(emphasis added)

And from the same report (*Appendix NA141*):

2.3.4 Time Delay Effects on Handling Qualities. Control difficulties during the 1977 Space Shuttle Approach and Landing Tests and YF-17 development resulted in efforts to investigate whether time delays associated with digital flight computers might be a contributing factor to the handling qualities problems. As discussed above, delays in flight control systems may come from a variety of sources. The effects of phase lag due to higher order effects, or analog time delay, had been studied (15) and were relatively well understood. A detailed study of the effects of pure delay, transport delay due to digital systems, had yet to be accomplished. In 1978 a NASA study employed an F-8 fighter aircraft modified with a digital flight control system to accomplish a detailed study of the effects of pure time delays on aircraft handling qualities (7, 4, 6). In 1979, Hodgkinson and others (29) conducted a study on the USAF/Calspan NT-33 inflight simulator in which they tested how mismatches between the higher order system and the LOES affected pilot opinion. They also investigated how well the delay term, e^{-sT} , in the LOES approximated the higher order phase lags and if the difference caused variations in pilot opinion. Both studies showed a strong correlation between pilot rating and the magnitude of the time delay, see Figures 2.8 and 2.10. The NT-33 data also showed that the degradation in pilot rating was similar for both digital transport delay and analog delay, or delay due to phase lag from higher order effects. The insidious nature of time delay's effects on handling qualities is demonstrated in a pilot comment during the F-8 research (7)

Pilots desire some response immediately upon stick input. It doesn't have to be much, but if he doesn't get response, his gains skyrocket.

The pilots in the NT-33 study also voiced similar concerns with delay after control inputs and the rapidity of the response following the delay. The authors of the F8 study (7) make a further observation that aircraft dynamics have an impact on system sensitivity to time delay.

(emphasis added)

So, is Borda saying that NASA did not determine and compensate for time delays in the X-38 synthetic vision flight control loop or simply that NASA did not use a computer to do so?

Which is it, because when a UAV is manually flown by a remote pilot, failure to compensate for delays in the communications link will lead to Pilot-Induced-Oscillation, which frequently leads to the loss of the aircraft.

Did NASA risk the X-38 by failing to provide compensation for the time delays in the synthetic vision flight control loop?

Conclusion

In its very tardy response to FOIA Request 08-270 by Jed Margolin (“Margolin”) NASA withheld documents, citing *5 U.S.C. §552(b)(5)*.

One of the documents that NASA withheld from Margolin is a letter dated March 19, 2009 that was sent by Gary G. Borda (“Borda”) NASA Agency Counsel for Intellectual Property to Optima Technology Group (“OTG”). (This document was given to Margolin by OTG.) In this letter Borda denies Claim I-222 regarding NASA’s infringement of U.S. Patent 5,904,724 (‘724) in the X-38 project.

Margolin’s FOIA 08-270 request to NASA was to produce documents relating to Claim I-222 and NASA withheld the most material document so far.

The Borda letter asserts:

“... numerous pieces of evidence were uncovered which would constitute anticipatory prior knowledge and prior art that was never considered by the U.S. Patent and Trademark Office during the prosecution of the application which matured into Patent No. 5,904,724.”

And states, “... NASA reserves the right to introduce such evidence of invalidity in an appropriate venue, should the same become necessary.”

Circulating the patent report solely within NASA or among other federal agencies is not an appropriate venue for NASA to use to have a patent declared invalid. The only appropriate venues for NASA to challenge the validity of a U.S. Patent are in the U.S. Court of Federal Claims and the Court of Appeals for the Federal Circuit. A Court will not accept NASA’s word that a patent is invalid due to prior art; NASA would be required to produce the evidence.

Therefore, the exemption under *5 U.S.C. §552(b)(5)* does not apply.

Margolin requests NASA produce the evidence that Borda refers to when he asserted:

“... numerous pieces of evidence were uncovered which would constitute anticipatory prior knowledge and prior art that was never considered by the U.S. Patent and Trademark Office during the prosecution of the application which matured into Patent No. 5,904,724.”

Margolin also requests that NASA show how such materials and/or documents are directed to the ‘724 claims.

And, finally, under 5 U.S.C. §552(f) NASA is required to provide the records between NASA and Rapid Imaging Software (Mike Abernathy) which provided the synthetic vision system for the X-38 project which was referred to in the Borda letter.

Respectfully,

Dated: June 10, 2009

/Jed Margolin/

Jed Margolin
1981 Empire Rd.
Reno, NV 89521-7430
775-847-7845
jm@jmargolin.com

Exhibit

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Date: 06/12/2009

Jed Margolin:

The following is in response to your 06/11/2009 request for delivery information on your Express Mail(R) item number EQ98 5211 585U S. The delivery record shows that this item was delivered on 06/12/2009 at 07:08 AM in WASHINGTON, DC 20546 to T JACKSON. The scanned image of the recipient information is provided below.

Signature of Recipient:

Delivery Section	
Signature	
Printed Name	TERKY JACKSON

Address of Recipient:

Delivery Address	NASA 20546
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Thank you for selecting the Postal Service for your mailing needs. If you require additional assistance, please contact your local Post Office or postal representative.

Sincerely,

United States Postal Service

Exhibit

10

Jed Margolin
Phone: 775-847-7845

1981 Empire Rd.
Email: jm@jargolin.com

Reno, NV 89521-7430
July 21, 2009

Mr. Randolph Harris
NASA Office of the General Counsel
300 E St. SW
Washington, DC 20546
Phone: (202) 358-2450
Fax: (202) 358-2741
Email: randolph.harris-1@nasa.gov

Dear Mr. Harris.

As per our conversation today please confirm that NASA refuses to waive legal service unless the Complaint and Summons is sent to NASA by Certified USPS mail, and will not waive legal service if it is sent by USPS Express Mail.

As I explained during our conversation, I sent Acting Administrator Scolese a certified letter in April which USPS did not deliver, and which USPS could not find. Their explanation was that Certified Mail is only scanned into their tracking system when it is mailed and when it is delivered. If it is lost in transit it cannot be tracked.

In addition, according to USPS, Certified Mail is sent to New Jersey to be irradiated (delaying delivery and increasing the chances of being lost) while Express Mail is not.

As a result I do not consider Certified USPS mail to be a viable means of sending a Complaint and Summons to NASA.

If NASA refuses to waive service by Express Mail my only option will be to use a Process Server.

BTW, according to Rule 4 of the Federal Rules of Civil Procedure (December 1, 2008) it looks like I also have to serve:

1. The Attorney General of the United States, Washington, DC; and
2. The United States attorney for the district for the district where the action is brought. That would be The United States District Court, District of Nevada-Reno.

If this is correct, please give me the name and address for the United States attorney for the District of Nevada-Reno.

Sincerely yours,

/Jed Margolin/

Jed Margolin

Exhibit

11

Jed Margolin

From: "McNutt, Jan (HQ-MC000)" <jan.mcnutt@nasa.gov>
To: "Jed Margolin" <jm@jmargolin.com>
Sent: Friday, July 24, 2009 10:42 AM
Subject: FOIA Appeal of FOIA No. 2008-270

Dear Mr. Margolin,

I've been informed that you are in contact with Mr. Randolph Harris of our office concerning the subject FOIA appeal. I have been assigned to respond to your appeal and as it stands, we are now past due in our response to you. I apologize for the delay and am officially requesting an extension for NASA to respond to your FOIA appeal. I would like to ask for a 20 day extension from the action due date that I received, which was July 17, 2009, which would require us to provide you with a response by August 6, 2009. We have every intention of providing you with a proper response, but circumstances have been such that we have not been able to process the response in the allotted time.

Thank you for your consideration of an extension in this matter.

Regards,

*Jan S. McNutt
Senior Attorney (Commercial)
Office of the General Counsel
NASA Headquarters
Suite 9T11
300 E Street, SW
Washington, DC 20546-0001
(202) 358-0632
Jan.McNutt@nasa.gov*

Exhibit

12

Jed Margolin

From: "Jed Margolin" <jm@jmargolin.com>
To: "McNutt, Jan (HQ-MC000)" <jan.mcnutt@nasa.gov>
Sent: Friday, July 24, 2009 12:53 PM
Subject: Re: FOIA Appeal of FOIA No. 2008-270

Mr. McNutt,

You wrote:

> I've been informed that you are in contact with Mr. Randolph Harris of our office concerning the subject FOIA appeal. I have been assigned to respond to your appeal and as it stands, we are now past due in our response to you. I apologize for the delay and am officially requesting an extension for NASA to respond to your FOIA appeal. I would like to ask for a 20 day extension from the action due date that I received, which was July 17, 2009, which would require us to provide you with a response by August 6, 2009. We have every intention of providing you with a proper response, but circumstances have been such that we have not been able to process the response in the allotted time.

My response:

1. NASA failed to respond or ask for an extension within the 20 day statutory period.
2. NASA has been acting in bad faith toward me for the past six years and some months.
3. You have personally acted in bad faith toward me by taking improper advantage of (and my regretting) every courtesy I have ever extended to you.
4. When I asked Mr. Harris if NASA would accept Legal Service by Express Mail, he said, "No." Only by Certified Mail. I explained that when I sent NASA Certified Mail in April, the USPS failed to deliver it and was unable to determine how it was lost or where. As a result, I do not consider Certified Mail reliable and I will have to pay a process server to serve Administrator Bolden. Mr. Harris still said, "No."
5. Mr. Harris has failed to respond to my email (and later fax) asking him to confirm what he told me in our telephone conversation (that NASA will not accept Legal Service by Express Mail).
6. Mr. Harris said NASA's response to my FOIA Appeal will be to send me a bunch of documents, but he didn't know when. He guessed "7 days." Your characterization of NASA's response contains no promise of documents, only "a proper response."

And so, Mr. McNutt, my answer to you is "No."

Sincerely yours,

Jed Margolin

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----- Original Message -----

From: [McNutt, Jan \(HQ-MC000\)](#)

To: [Jed Margolin](#)

Sent: Friday, July 24, 2009 10:42 AM

Subject: FOIA Appeal of FOIA No. 2008-270

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Thank you for your consideration of an extension in this matter.

Regards,

*Jan S. McNutt
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Washington, DC 20546-0001
(202) 358-0632
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